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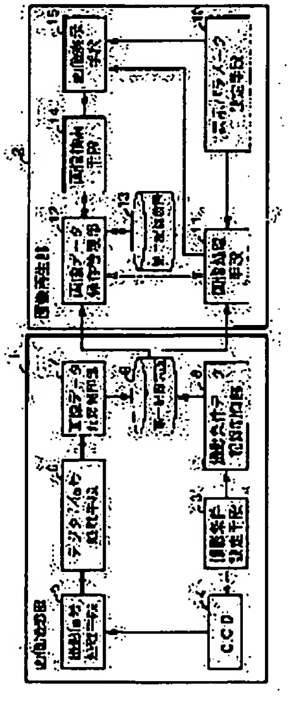
(72)Inventor : KOORIYAMA MIO
YAGAWA YUICHI

(54) ELECTRONIC ALBUM SYSTEM WITH PHOTOGRAPHING FUNCTION

(57)Abstract:



PURPOSE: To automatically process image data corresponding to the environment of displaying or photographing and to clearly display which kind of image is recorded in a recorder at high speed.

CONSTITUTION: At the time of photographing, an image signal outputted from a CCD 4 is converted to image data by signal processing means 5 and 6 and recorded in a first recorder 9. At such a time, photographic condition data showing the environment of photographing (a focus position, for example) outputted from a photographic condition setting means 3 are correspondently recorded as well. At the time of reproducing, an image processing means 11 performs prescribed processing to the image data corresponding to a display parameter showing the environment of displaying (a display size, for example) outputted from a display parameter setting means 10 and the photographic condition data and displays the result on an image display means 15. This processing is processing for extracting a partial symbolic image including the focus position from the image expressed by the image data, for example, and enlarging/reducing the extracted result corresponding to the display size.

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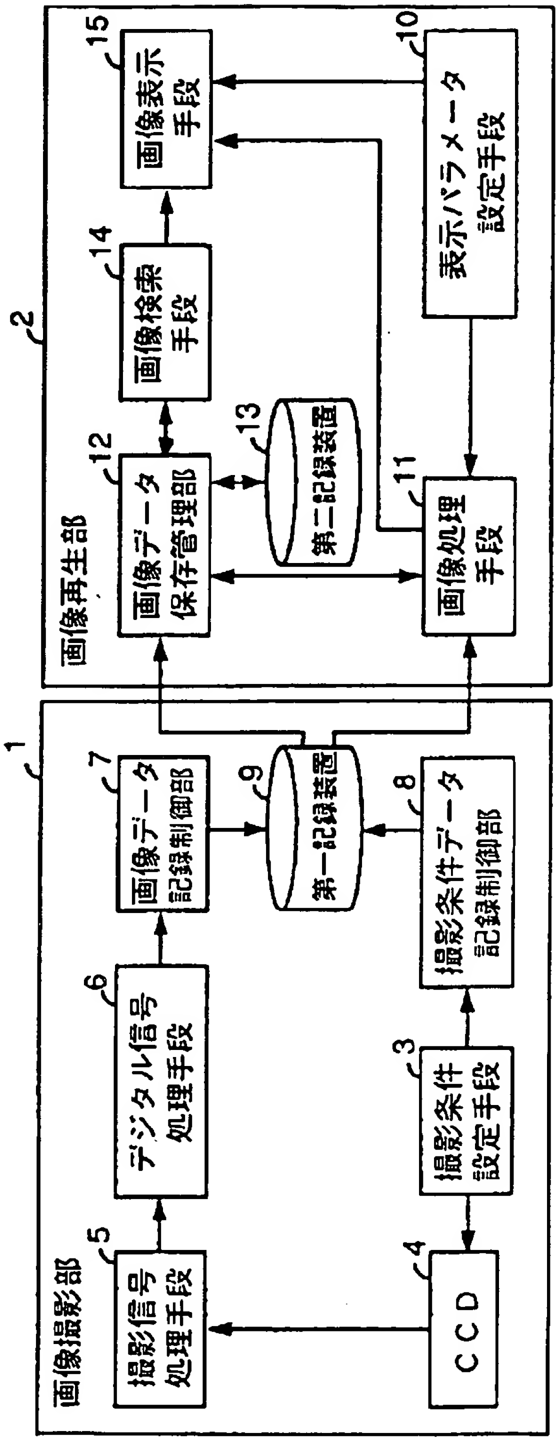
DRAWINGS

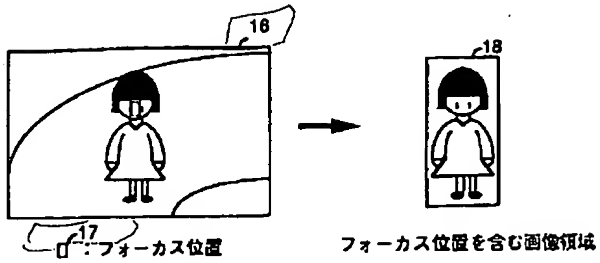
[Drawing 1]

図1


画像撮影部
1
撮影信号処理手段
5
デジタル信号処理手段
6
画像データ記録制御部
7
CCD
4
撮影条件設定手段
3
撮影条件データ記録制御部
8
第一記録装置
9
画像再生部
2
画像データ保存管理部
12
画像検索手段
14
画像表示手段
15
第二記録装置
13
画像処理手段
11
表示パラメータ設定手段
10

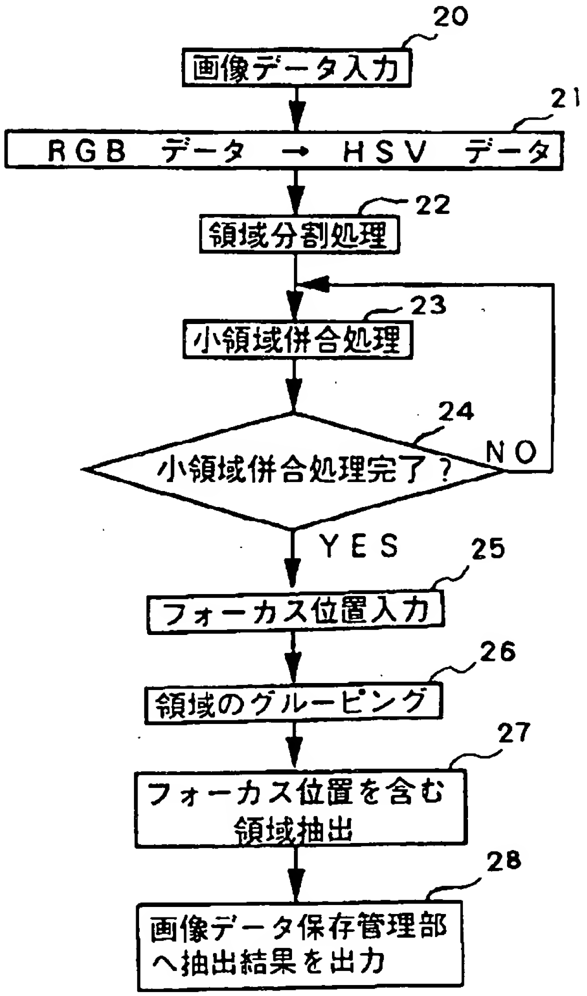
[Drawing 2]

図2


16
17
□：フォーカス位置
18
フォーカス位置を含む画像領域

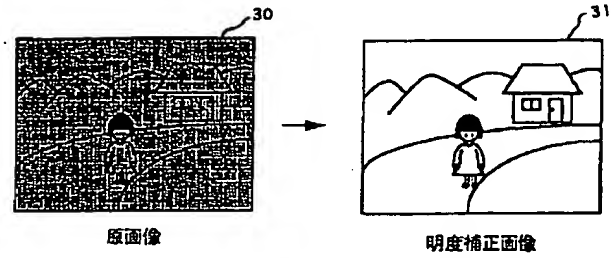
[Drawing 3]

図3


20
画像データ入力
21
RGB データ → HSV データ
22
領域分割処理
23
小領域併合処理
24
小領域併合処理完了？
NO
YES
25
フォーカス位置入力
26
領域のグルーピング
27
フォーカス位置を含む領域抽出
28
画像データ保存管理部へ抽出結果を出力

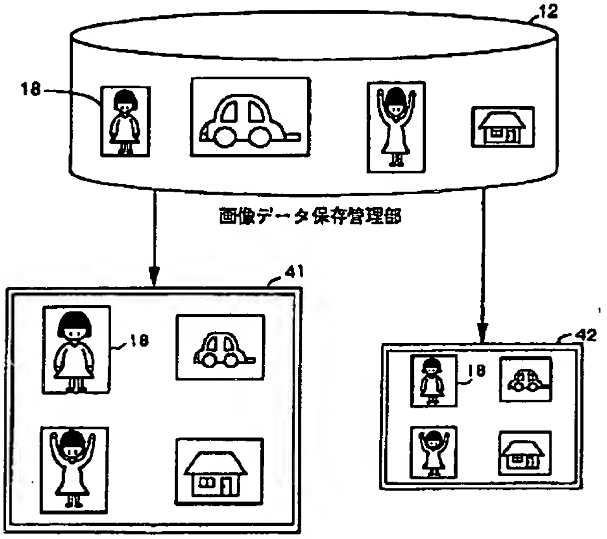
[Drawing 4]

図4


30
31
原画像
明度補正画像

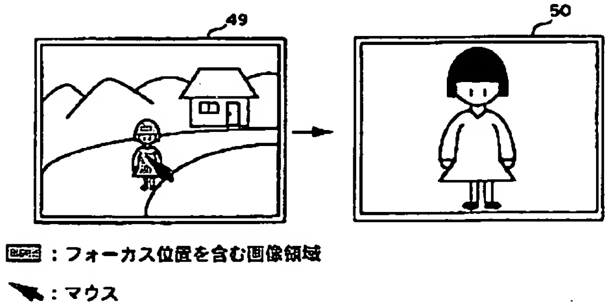
[Drawing 6]

図6


12
18
画像データ保存管理部
41
18
42
18

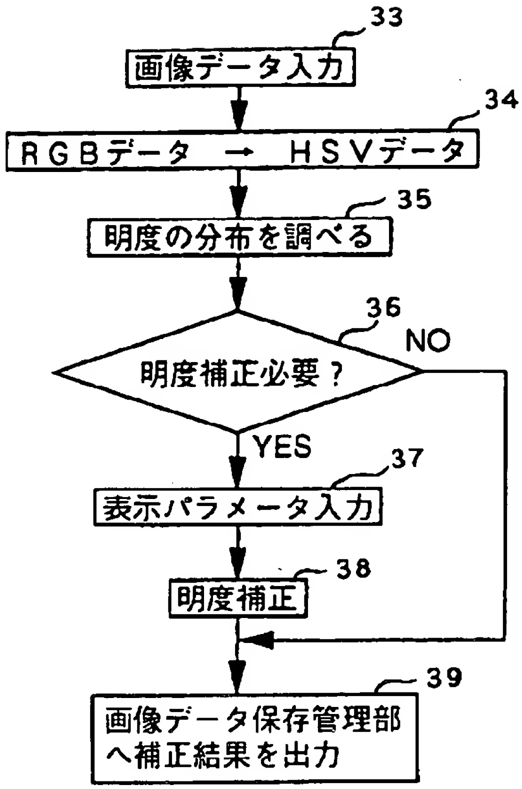
[Drawing 8]

図8


49
50
▨ ：フォーカス位置を含む画像領域
：マウス

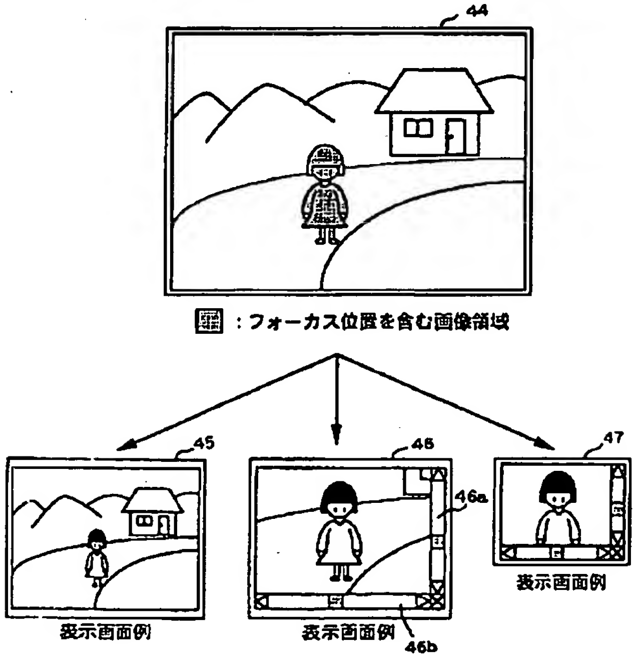
[Drawing 5]

図5


33
画像データ入力
34
RGBデータ → HSVデータ
35
明度の分布を調べる
36
明度補正必要？
NO
YES
37
表示パラメータ入力
38
明度補正
39
画像データ保存管理部
へ補正結果を出力

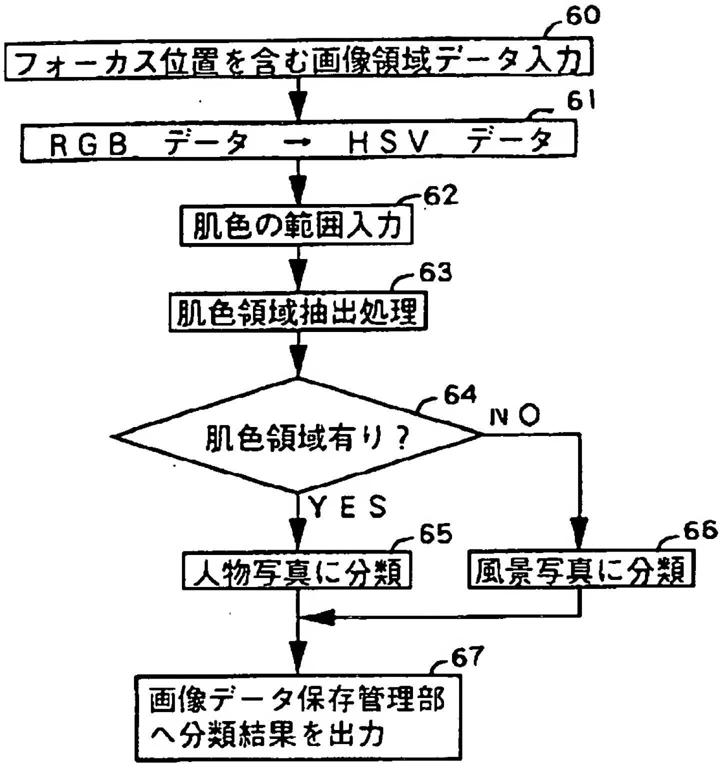
[Drawing 7]

図7


44
▦：フォーカス位置を含む画像領域
45
46
46a
46b
47
表示画面例
表示画面例
表示画面例

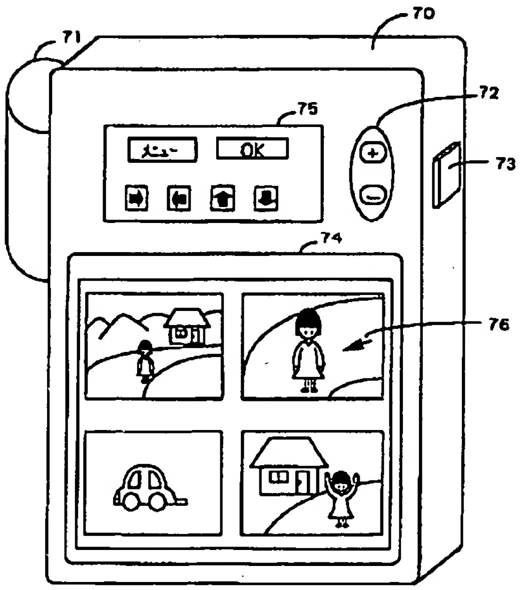
[Drawing 10]

図10


60
フォーカス位置を含む画像領域データ入力
61
RGB データ → HSV データ
62
肌色の範囲入力
63
肌色領域抽出処理
64
肌色領域有り？
NO
YES
65
人物写真に分類
66
風景写真に分類
67
画像データ保存管理部へ分類結果を出力

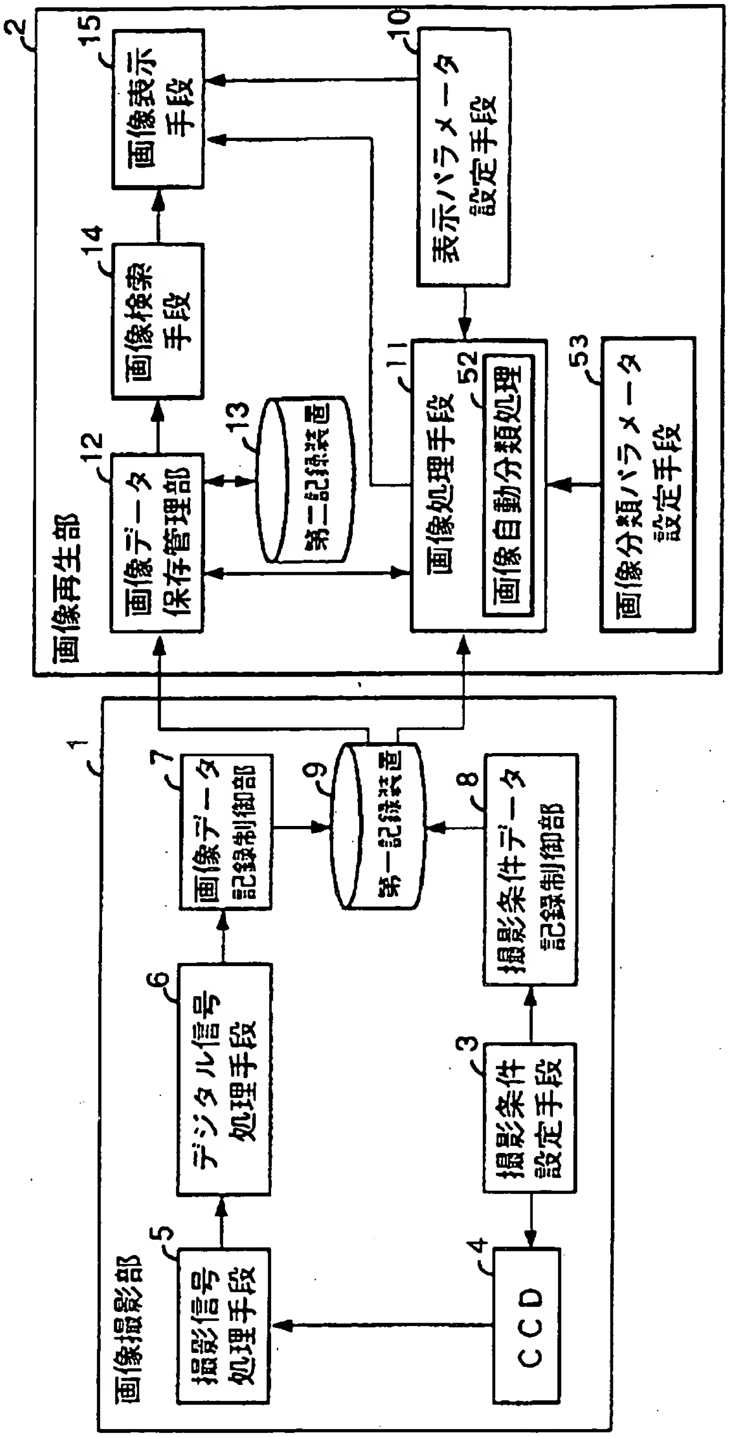
[Drawing 11]

図11


70
71
72
73
74
75
76
ﾒﾆｭｰ
OK

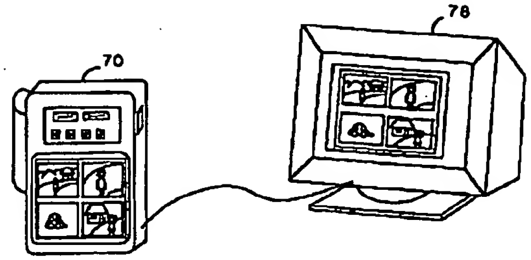
[Drawing 9]

図9


画像撮影部
1
撮影信号処理手段
5
CCD
4
デジタル信号処理手段
6
撮影条件設定手段
3
画像データ記録制御部
7
撮影条件データ記録制御部
8
第一記録装置
9
画像再生部
2
画像データ保存管理部
12
第二記録装置
13
画像検索手段
14
画像表示手段
15
画像処理手段
11
画像自動分類処理
52
表示パラメータ設定手段
10
画像分類パラメータ設定手段
53

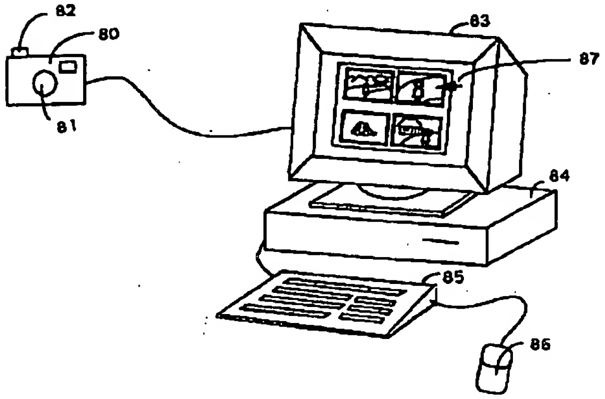
[Drawing 12]

図12



[Drawing 13]

図13


82
80
81
83
87
84
85
86

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the electronic album system with a photography function which displays the image which the recorded image data expresses on a screen according to the demand from a user while it generates the image data which the photoed image expresses and records the image data concerned.
[0002]
[Description of the Prior Art] An electronic "still" camera takes a photograph electronically, the image data obtained by that cause is recorded, and the magnetic recording medium which can record data is used for the record. Moreover, at the time of playback, the image data recorded on the recording device is changed into a video signal, and is immediately expressed as external TV screen etc. In recent years, the system which gave various functions to this electronic "still" camera is proposed. Below, the example of a system in which the electronic "still" camera was used is explained.
[0003] It connects with the electronic "still" camera which records the photoed static image (the following, photograph) on the internal Records Department in the form of image data, and the electronic "still" camera concerned, and the system indicated by JP,3-129975,A consists of image processing equipment which processes to the above-mentioned image data. This image processing equipment extracts and recognizes the English alphabetic character (for example, display of a signboard) contained in the photograph which the above-mentioned image data expresses, translate it, it outputs to fitting the alphabetic character which translated that English into Japanese with directions of a user, and outputs that result to a subject-copy image at the Records Department of an electronic "still" camera. However, in this system, a photograph will differ from a subject-copy image delicately by processing of an image.
[0004] The system indicated by JP,4-115788,A consists of a digital electronic "still" camera which records the image data obtained by photography on a record medium, and a regenerative apparatus which reads image data from the record medium concerned, and reproduces an image. A digital electronic "still" camera sets and records the photography condition data which expresses photography environment (time etc.) in case image data is recorded, and picture reproducer inputs and compares the retrieval question data for specifying an image outputted according to assignment of a user with the photography condition data currently recorded on the record medium, determines the high image data of a possibility correspond to the question data concerned, and indicates by sequential from the high image of a possibility. That is, this system can search a photograph from photography condition data.
[0005]
[Problem(s) to be Solved by the Invention] Now, the photographs which an individual uses as a hand are those with dozens of - hundreds of sheets per year, a travel, etc., and may use dozens of photographs as a hand at once. However, when a photograph is taken with an electronic "still" camera, since an image is recorded on a record medium as digital data, it cannot know the contents of the image from appearance. Although it is necessary to reproduce and display one image data at a time in order to investigate the contents of the image data recorded on the recording device, this activity is very troublesome for a user.

[0006] In order to solve this problem, it is necessary to perform a certain processing like two examples mentioned above at the time of photography or playback. For example, two or more viewing areas which display the reproduced image are prepared, and although the technology of displaying two or more photographs on coincidence can be considered, since the magnitude of a viewing area is restricted in this case, for example, when it is a landscape image, the problem of only the empty reflected to the upper part being displayed arises. If processing which reduces a photograph is performed as this cure, it will not be clear anymore what photograph it is with contraction. Moreover, when making it display only the characteristic portion of the photographs, a user has to specify the image portion beforehand. Furthermore, in the display of the image photoed on the day of the interior of a room or cloudiness, since the displayed image becomes very not clear when the whole image becomes gloomy and the display is especially made by black and white, a user has to perform actuation for amending the lightness of a screen himself. Thus, since a user will need to perform a certain actuation for every image data when performing an image processing to image data, the burden placed on a user is large.
[0007] Then, this invention aims at offering a high speed and the system which can be displayed clearly for what kind of image is recorded on the recording device by processing image data automatically according to photography environment.
[0008] Moreover, it aims at offering the system which can display an image clearly according to display environment by processing image data automatically according to display environment.
[0009]
[Means for Solving the Problem] A signal-processing means to generate image data according to an image obtained by photography in this invention in order to attain the above-mentioned purpose, While receiving conditions at the time of taking a photograph to an electronic album system with a photography function which consists of a recording device which records generated image data, and an image display means to display an image according to directions of a user A photography conditioning means to generate photography condition data showing the conditions concerned, and a photography condition data-logging control means which matches generated photography condition data with said image data, and is recorded on said recording device, An image-processing means to perform a predetermined image processing to image data by which reading appearance was carried out corresponding to said photography condition data based on photography condition data by which reading appearance was carried out from said recording device is established, and said image display means displayed an image which image data to which an image processing was performed expresses.
[0010] Moreover, a signal-processing means to generate image data according to an image obtained by photography, While receiving conditions at the time of displaying an image on an electronic album system with a photography function which consists of a recording device which records generated image data, and an image display means to display an image according to directions of a user from a user A display parameter setup means to generate a display parameter showing the conditions concerned, Based on said display parameter, an image-processing means to perform a predetermined image processing to image data by which reading appearance was carried out from said record means is established, and said image display means displayed an image which image data to which an image processing was performed expresses.
[0011] In addition, an electronic album system with a photography function is equipped with both said photography conditioning means and a display parameter setup means, and you may make it have an image-processing means to process image data according to photography condition data and a display parameter.
[0012] Furthermore, based on an image classification parameter setup means to generate an image classification parameter which expresses the conditions concerned with it while receiving conditions which specify the feature of an image from a user to an electronic album system with a photography function, said photography condition data and said display parameter, said image classification parameter, and said image data, an image classification processing means to classify the image data concerned may be established.
[0013]

[Function] The photography object observed when a photography person surely took a photograph to a photograph exists, and the object expresses the feature of a photograph clearly. Moreover, in almost all cases, a photography person takes a photograph by uniting a focal location or a focus location with a photography object. Then, with the image data showing a photograph, this invention recorded for example, the focal location or the focus location as photography condition data, from the image which image data expresses, extracts automatically a symbolic image field including a focal location or a focus location, and displayed it. Thus, since the image of the extracted image field has little amount of data, it can display many images on a high speed by one display. And a user can confirm the contents of record of a recording device in a short time, without performing troublesome actuation, or can search a photograph to see now visually.

[0014] Moreover, when the magnitude of the viewing area as which a photograph is displayed, and display parameter setup means to generate the display parameter which shows display environment, such as a display mode (color display or monochrome display), are established, an image-processing means is made to process to image data according to a display parameter, and display environment changes, the partial image in which a photograph or its feature is shown can be displayed clearly. For example, the image to display is expanded reduced according to the magnitude of the viewing area which the user set up, or when the viewing area which the user set up is small, the display position of the image in a viewing area is corrected so that the partial image in which the feature of an image was shown may be displayed certainly.

[0015] Furthermore, a photograph can be automatically classified now without actuation of a user by establishing an image classification parameter setup means and an image classification processing means to classify a photograph according to the parameter set up there. The flesh color which is a color of human being's skin is set up as an image classification parameter. For example, an image-processing means By constituting so that it may classify as a landscape image, if it judges automatically whether there is any beige field, i.e., a face, to an image field including a focal location or a focus location, a beige field is located as a result in it to it and there will not be a portrait image and a beige field In the case of the display of a photograph, or visual retrieval, a photograph can be displayed for every provisions of classification, and a user can perform now more check of the contents of record of a recording device, and retrieval of an image to see in a short time.

[0016] As mentioned above, according to this invention, the image suitable for the convenient display environment and the photography environment for a user is reproducible by processing image data according to photography condition data or a display parameter.

[0017]

[Example] Hereafter, the example of this invention is explained to details using a drawing.

[0018] Drawing 1 is the block diagram showing the electronic album structure of a system concerning one example of this invention. As shown in this drawing, this system photos a photograph and consists of the image photography section 1 which records the image data obtained by photography, and the image reconstruction section 2 which displays the photograph which accumulates and manages that image data and image data expresses according to the demand from a user.

[0019] In the photography section 1 of drawing 1 , the photography conditioning means 3 generates the photography condition data which expresses a focal location or a focus location at the time of photography. Here, a focal location shows the mid gear of the photoed image, and a focus location shows the location of the object point of having doubled the focus. Below, a focal location shall be used. The photography condition data-logging control section 8 records the photography condition data inputted from the photography conditioning means 3 on the first recording device 9. This recording device is good anything, if a magnetic disk drive, an optical disk unit, etc. can record data. CCD (Charge-Coupled Divice: charge-coupled device)4 picturizes the static image of a photographic subject according to photography condition data, and generates the image pick-up signal according to an image pick-up result. The photography signal-processing means 5 performs signal processing, such as sampling, to the image pick-up signal inputted from CCD4, and changes an image pick-up signal into a digital signal. The digital-signal-processing means 6 changes into the image data of RGB the digital signal inputted from the photography signal-processing means 5. The image data-logging control section 7 records the image data inputted from the digital-signal-processing means 6 on the first recording device 9 synchronizing with record actuation of the above-mentioned photography condition data-logging control section 8. That is, above-mentioned image data and photography condition data are recorded in the condition of having been matched.

[0020] In the image reconstruction section 2, the display parameter setup means 10 outputs many setup (henceforth, display parameter) about a display which the user set up in the form of data. While the image-processing means 11 carries out the image processing of the image data recorded on the first recording device 9 automatically based on the photography condition data recorded on the first above-mentioned recording device 9, and the display parameter inputted from the display parameter setup means 10, it carries out the image processing of the image data recorded on the second recording device 13 automatically based on a display parameter. This image processing is explained in detail later. The image data storage Management Department 12 records the image data and photography condition data which were recorded on the first recording device 9, and the image data after the image processing inputted from the image-processing means 11 on the second recording device 13, and performs the management. The image data storage Management Department 12 specifies the class of image data read from the second recording device 13 according to directions of a user, and the image retrieval means 14 outputs the image data by which reading appearance was carried out as a result to the image display means 15. For example, all photographs are displayed in order, or a specific photograph is chosen and displayed. The image display means 15 displays the image which a video signal expresses according to the display parameter (for example, lightness) given from the display parameter setup means 10 while changing into a video signal the image data inputted from the image-processing means 11 and the image retrieval means 14.

[0021] Next, the feature of this example and actuation of an image-processing means 11 to realize it are explained for every function.

[0022] Drawing 2 is drawing for explaining the concept of the image extract performed by this example, and the image field 18 including the focal location 17 extracted from the subject-copy image 16 obtained by photography and the subject-copy image 16 is shown in this drawing. This image field 18 expresses the feature of a photograph with a small viewing area well including the image of the object observed when a photography person took a photograph. In this example, the extract of this image field 18 is automatically performed by the image-processing means 11.

[0023] Below, it explains using the flow chart which shows actuation of the image-processing means 11 about this image extract to drawing 3 . First, the image-processing means 11 incorporates the image data of the format of RGB (step 20), and changes the RGB data into the HSV data based on a HSV color coordinate system (step 21). The HSV color coordinate system used for this conversion is one of the perception-color coordinate systems, in H, a hue and S show saturation and V shows lightness. Next, the Euclidean distance of (H, S, V) between the adjoining pixels is found, and when the calculated distance value is in the threshold set up beforehand, it judges with it being that in which the pixel concerned is contained to the same field. This processing is performed to all the pixels that adjoin in the direction of four directions, and an image is divided into the field whose some settled (step 22). And small field merge processing by which the small field is merged to the field of one of adjoining four directions among each field by which field division was carried out is performed (step 23). The Euclidean distance of the average of the HSV pixel contained to a certain small field and the average of the HSV pixel contained to an adjoining field is found, and a small field is made merged and it goes by this processing to the field where Euclidean distance is the shortest. And the processing is repeated until the field merged is lost (step 24). Next, the focal location of a photograph is obtained from the photography condition data inputted (step 25), and other image fields relevant to the image field in this focal location are merged (step 26). This processing merges using a color, and it merges so that beige image fields (a face, a hand, leg, etc.) may be connected in the case of a portrait image. In addition, an image portion to the point performs processing which emphasizes an edge to a photograph, using the feature that an outline is displayed clearly, and you may make it the image field which has high edge level merged to an image field including a focal location. Next, the rectangular frame which connotes an image field including the merged focal location extracts an image (step 27). In addition, you may make it extract the image field of the predetermined magnitude centering on a focal location simply in this processing. At the end, the image data corresponding to the extracted image field is outputted to the image data storage Management Department 12, and it is made to record on the second recording device 13.

[0024] It becomes possible to extract automatically an image field including a focal location, i.e., the partial image field which shows the feature of a subject-copy image, from a subject-copy image by processing explained above.

[0025] Drawing 4 is drawing for explaining the concept of the amendment processing of lightness performed in this example, and the low subject-copy image 30 of the lightness photoed in the condition dark in comparison and the image 31 after lightness amendment obtained by performing amendment processing of lightness in that subject-copy image 30 are shown in this drawing. ** to which, as for the photograph photoed on the day of the interior of a room or cloudiness, the whole image becomes gloomy at the time of that playback -- it becomes hard to see -- although it is and there are many things, a user can be automatically provided with a clear image by this amendment processing.

[0026] The example of the image-processing means 11 about amendment processing of lightness of operation is explained using the flow chart of drawing 5 .

[0027] Introduction and the image-processing means 11 incorporate the image data of the format of RGB (step 33), and change the image data into HSV data (step 34). Next, distribution of the lightness of the pixel which constitutes a subject-copy image using HSV data is investigated (step 35). In this example, the color of the target pixel is investigated with lightness using saturation at this time, and when that color is black or gray (i.e., when it is the low thing of lightness from the first), that pixel is removed from distribution of lightness. And when distribution of the low pixel of lightness is larger than the range set up beforehand, it judges with amendment of lightness being required. Consequently, if amendment is required, it will progress to the next processing, and processing will be ended if amendment is unnecessary (step 36). Next, a display parameter is incorporated and it investigates whether a display is performed in a color from the value, or it is carried out in monochrome (step 37). And it processes to image data so that the lightness of an image may be raised on the whole (step 38). Under the present circumstances, when it is checked at a front step that it is a monochrome display, lightness is amended on level higher than the amendment at the time of color display. This is because in the case of a monochrome display a screen will become black on the whole if lightness is low, and it becomes [what is reflected and] unclear. After reconverting the amended HSV data to RGB data at the end, the conservation Management Department 12 is made to record on delivery and the second recording device 13 (step 39).

[0028] The above processing can perform amendment of the lightness of a photograph automatically according to image data and a display parameter (display environment).

[0029] Now, in this example, the user is giving easy and the function which displays two or more photographs on coincidence in order to enable it to carry out for a short time to the image-processing means 11 for visual retrieval of a photograph. Moreover, it enables it to display many photographs on the field to which magnitude was restricted by using the image field which includes the focal location mentioned above as two or more photographs displayed on coincidence. Drawing 6 is drawing showing the example of a display at this time, and among drawing, the display image 41 shows the example of a display when a display image 42 has the small display screen, respectively, when the display screen is large. Here, the image of the image field 18 including a focal location is expanded to a display image 41, respectively, and it is displayed, and on the whole, reverse contracts and the image field 18 is shown in the display screen 42. This display processing is performed by the following procedures. The image-processing means 11 determines the size of photograph each based on the number of the photographs displayed on coincidence as the size of the display screen which the inputted display parameter shows first. And the image field 18 including an above focal location currently recorded on the second recording device 13 using the image data storage Management Department 12 is read, it expands or reduces according to the determined photograph size, and the image obtained by that cause is displayed on a display.

[0030] Since each photograph displayed as mentioned above is a partial image in which the feature of a subject-copy image was shown well, when it reduces, a user can identify easily what photograph it is. Moreover, since the photograph of two or more sheets is displayed on coincidence, the time amount which retrieval takes is shortened.

[0031] In this example, the size of the field where it can also display for [one / every] appreciation of a photograph, and the display of a photograph is performed using the display parameter setup means 10 can also be changed. The greatest viewing-area size which can be used for appreciation of a photograph, and the minimum viewing-area size are beforehand set to the display parameter setup means 10, and when the set-up size has the size of the viewing area specified by a user out of range, viewing-area size is corrected to the greatest area size or the greatest, minimum area size. And it responds to the size of the set-up viewing area, and expands or reduces, and, as for the image-processing means 11, a photograph is displayed. Drawing 7 is drawing showing the example of a display of a photograph at this time. Among drawing, the display image 44 shows the example of a display of the subject-copy image before changing the size of a viewing area, and display images 45-47 show the example of a display when making the viewing area of a display image 44 small, respectively. Among these, a display image 45 reduces and displays a photograph according to the size of an image field. The display screens 46 and 47 are displayed on the set-up viewing area, without reducing a photograph. Since a display is performed centering on the object observed when a photography person took a photograph, a user can know what photograph it is by the partial display of a photograph at this example, so that these display images 25 and 26 may show. A display image 25 doubles the center of an image field including a focal location with the center of a viewing area, and, specifically, is obtained by displaying a photograph. Moreover, a display image 26 is obtained by displaying the upper part of an image field including a focal location according to the center of the upper part of a viewing area.

[0032] In addition, when the viewing-area size specified by a user is smaller than the minimum area size set up beforehand, a photograph is reduced in accordance with the minimum viewing-area size, and you may make it display in the size of the viewing area as which the user specified the image. Under the present circumstances, since an image field including a focal location may not be displayed partially, it is convenient if the images 46a and 46b for scrolling etc. are displayed as shown in display images 25 and 26, and it enables it to scroll a photograph in the direction of four directions.

[0033] Moreover, the image-processing means 11 may be constituted so that either of the display images 24-26 explained above can be generated, and you may enable it to generate it combining each of display images 24-26.

[0034] It may be able to stop being able to judge who in the place, when taking a photograph in the game of soccer etc., in order to take a photograph in the location distant from the player who is a candidate for photography, is reflected by the ability not copying the player of the object greatly at the time of playback of the image. For this reason, it is reflected small, and the photography object with which the photography person observed at the time of photography enables it to expand and display only the image of that object in this example, when hard to see. This actuation is concretely explained using drawing 8 . If a user chooses the image for [of the photographs 49 shown in drawing 8] photography using a mouse, the image-processing means 11 will read the image data of an image field including the focal location of the photograph 49 from the 2nd recording device 13 using the image data storage Management Department 12, and will display the display image 50 to which the image field was expanded on the display means 15.

[0035] By this processing, only a player's image which for example, the photography person observed can be expanded and displayed now, therefore a user can see the player for photography clearly.

[0036] Drawing 9 is the block diagram showing the configuration of other examples of this invention. The example shown in this drawing enables it to classify an image automatically, equips with the image classification parameter setup means 53 the image reconstruction section 2 of the example shown in drawing 1 , and equips the image-processing means 11 with the image automatic-classification processing means 52.

[0037] The image automatic-classification processing means 52 classifies a photograph by carrying out the image processing of the image data recorded on the first recording device 9 or second recording device 13 automatically based on the photography condition data recorded on the first recording device 9, the display parameter inputted from the display parameter setup means 10, and the image classification parameter inputted from the image classification parameter setup means 53.

[0038] By the way, a photograph is divided roughly into a person photograph and a scenery photograph. Moreover, in the case of a portrait image, an image field including a focal location has a high possibility of being human being. Then, in this example, the flesh color which is a color of human being's skin is set up as an image classification parameter, and if it judges automatically, there is a beige field as a result and there will not be a portrait image and a beige field, he classifies as a landscape image whether it is in an image field including a focal location, beige field, i.e., face, and is trying to use it for retrieval.

[0039] It explains in detail using the flow chart which shows actuation of the image-processing means 11 about this classification processing to drawing 10 . First, the image-processing means 11 inputs the image data of an image field including a focal location from the second recording device 13 through the image data storage Management Department 12 (step 60). Next, the above-mentioned image data is changed into HSV data from RGB data (step 61). It is because the gray level histogram of an image is related beige, as for using HSV data, a HSV color coordinate system has a clear peak compared with RGB data and fluctuation by change of lightness is characterized by few things. Next, the beige range 41 in a color table is set up with the image classification parameter setup means 38, it inputs as an image classification parameter (step 62), and a beige field is extracted from image data (step 63). It judges whether this processing is in the respectively beige range 41 about the HSV data of each pixel of image data. When it investigates whether the beige field more than a predetermined area is in image data as a result of this processing (step 64) and there is a beige field more than a predetermined area, it judges that human being's face is in image data, and classifies into a portrait image (step 65). Moreover, when there is no beige field more than fixed area, it classifies into a landscape image (step 66). And the information which shows the classified image data and its classification result is outputted to the image data storage Management Department 12, and it is made to record on the 2nd recording device (step 67).

[0040] The image retrieval means 14 can display a photograph for every provisions of classification by retrieving the information which shows the above-mentioned classification result. That is, since only a portrait image can be displayed for example, when a user wants to search a photograph from a person, a photograph can be searched more in a short time. In addition, when the above processing can be used besides a classification of a portrait image and a landscape image, for example, many automobiles are photoed, the photography result can be classified according to a color.

[0041] Drawing 11 - drawing 13 are drawings which illustrated the appearance of the example mentioned above. Below, the use gestalt of the example of this invention is explained using these drawings.

[0042] Drawing 11 is the external view of an electronic camera 70 which carried the image photography section 1 mentioned above and the image reconstruction section 2 in one. In this drawing, the image captured through the lens 71 is serially displayed on the display 74 mounted in the main part of an electronic camera 70 in the case of photography, and a photography person unites the direction of a lens 71 with an object, checking that display. And by operating a carbon button 72, a zoom is adjusted and a photograph is taken by pushing a shutter 73. Playback of a photograph is also performed on a display 74 and a user performs selection of processings, such as retrieval of a photograph and expansion, selection of a photograph, etc. using the cursor 76 displayed as the selection carbon button group 75 according to the actuation. In addition, in the equipment shown in drawing 11 , it is one recording device and can serve as the 1st and 2nd recording devices (drawing 1).

[0043] The above-mentioned electronic camera 70 can be connected to an external display, and a clearer photograph can also be reproduced. Drawing 12 is drawing showing the situation of the connection at this time, and a display. The video signal outputted from the image display means 15 of the image reconstruction section 2 of an electronic camera 70 is sent to a display 78 through a cable, and the display parameter which shows brightness etc. through this cable is sent from a display 78. In addition,

since processing of an image is altogether performed inside an electronic camera 70, common television can be used as a display 53.
[0044] Drawing 13 is drawing showing the appearance at the time of constituting the photography section 1 and the image reconstruction section 2 from a respectively different device. In drawing, an electronic camera 80 corresponds to the photography section 1, and the display 83, the computer 84, the keyboard 85, and the mouse 86 support the image reconstruction section 2. By program manipulation, a computer 84 realizes the function of the image-processing means 11 grade which the image reconstruction section 2 has. An electronic camera 80 can be independently used for photography of a photograph, associates the data and the image data which show photography conditions at the time of photography, and records them on an internal recording device. At the time of playback of a photograph, the image data and photography condition data which were recorded on the recording device of an electronic camera 80 are made to transmit to a computer 84, and the photograph obtained by processing of a computer 84 is displayed on a display 83. Selection of processings, such as retrieval of a photograph and expansion, selection of an image, etc. are performed using the cursor 87 displayed according to actuation of a keyboard 56, a mouse 86, and a mouse 86.
[0045]
[Effect of the Invention] As explained above, a high speed and since it enabled it to display clearly, according to this invention, a user can perform check of the contents of record of a recording device, and retrieval of an image to see for what kind of image is recorded on the recording device in easy and a short time by processing image data automatically according to photography environment.
[0046] Moreover, since it enabled it to display an image clearly by processing image data automatically according to display environment according to display environment, it applies to modification of the magnitude of a viewing area, and distribution of the lightness of each image, and an image can be displayed in the legible condition for a user.

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] A signal-processing means to generate image data according to an image obtained by photography An image display means to display a recording device which records generated image data, and an image according to directions of a user While being the electronic album system equipped with the above with an image photography function and receiving conditions at the time of taking a photograph A photography conditioning means to generate photography condition data showing the conditions concerned, and a photography condition data-logging control means which matches generated photography condition data with said image data, and is recorded on said recording device, An image-processing means to perform a predetermined image processing to image data by which reading appearance was carried out corresponding to said photography condition data based on photography condition data by which reading appearance was carried out from said recording device is established, and it is characterized by said image display means displaying an image which image data to which an image processing was performed expresses.
[Claim 2] A signal-processing means to generate image data according to an image obtained by photography An image display means to display a recording device which records generated image data, and an image according to directions of a user A display parameter setting-out means is the electronic album system equipped with the above with an image photography function, and generate a display parameter showing the conditions concerned while receiving conditions at the time of displaying an image from a user, and an image-processing means perform a predetermined image processing to image data by which reading appearance was carried out from said recording device based on said display parameter establish, and it is characterized by for said image-display means to display the image which image data to which an image processing was performed expresses.
[Claim 3] A signal-processing means to generate image data according to an image obtained by photography The 1st recording device which records generated image data While being the electronic album system equipped with the above with an image photography function and receiving conditions at the time of taking a photograph in said image photography section A photography conditioning means to generate photography condition data showing the conditions concerned, and a photography condition data-logging control means which matches generated photography condition data with said image data, and is recorded on said 1st recording device are established. It is based on photography condition data by which reading appearance was carried out to said image reconstruction section from said 1st record means. An image-processing means to perform a predetermined image processing to image data by which reading appearance was carried out corresponding to the photography condition data concerned is established, and it is characterized by said image display means displaying an image which image data to which an image processing was performed expresses.
[Claim 4] A signal-processing means to generate image data according to an image obtained by photography The 1st recording device which records generated image data While being the electronic album system equipped with the above with an image photography function and receiving conditions at the time of displaying an image on said image reconstruction section from a user A display parameter

setting-out means to generate a display parameter showing the conditions concerned, Based on said display parameter, an image-processing means to perform a predetermined image processing to image data by which reading appearance was carried out from said 1st or 2nd record means is established, and it is characterized by said image display means displaying an image which image data to which an image processing was performed expresses.
[Claim 5] A signal-processing means to generate image data according to an image obtained by photography The 1st recording device which records generated image data While being the electronic album system equipped with the above with an image photography function and receiving conditions at the time of displaying an image on said image photography section A photography conditioning means to generate photography condition data showing the conditions concerned, and a photography condition data-logging control means which matches generated photography condition data with said image data, and is recorded on said 1st recording device are established. While receiving conditions at the time of displaying an image on said image reconstruction section from a user A display parameter setting-out means to generate a display parameter showing the conditions concerned, It is based on photography condition data by which reading appearance was carried out to said display parameter from said 1st record means. An image-processing means to perform a predetermined image processing to image data by which reading appearance was carried out corresponding to the photography condition data concerned is established, and it is characterized by said image display means displaying an image which image data to which an image processing was performed expresses.
[Claim 6] It is the electronic album system according to claim 5 with an image photography function characterize by to extract an image field including said focal location or a focus location from the image field which divided while divide the image with which said image data expresses said image processing means including information as which said photography condition data expresses a focal location or a focus location into the image field which consists of pixels relate mutually .
[Claim 7] Said image-processing means is an electronic album system according to claim 6 with an image photography function characterized by changing magnitude of an image of an image field including an image which is displayed on said viewing area, and which said image data expresses, said focal location, or a focus location according to magnitude of the viewing area concerned including information as which said display parameter expresses magnitude of a viewing area of an image.
[Claim 8] Said image-processing means is an electronic album system according to claim 7 with an image photography function characterized by processing to said image data so that a center of an image field including said focal location or a focus location or the focal location focus location concerned may be doubled with a center of said viewing area and an image may be displayed.
[Claim 9] Said image-processing means is an electronic album system according to claim 7 with an image photography function characterized by processing to said image data so that the upper part of an image field including said focal location or a focus location may be doubled in the center of the upper part of said viewing area and an image may be displayed.
[Claim 10] Said display parameter includes information an image indicates it to be by any it shall be displayed between black and white and a color. Said image-processing means While searching for distribution of lightness of an image which said image data expresses, when an image field of lightness lower than predetermined level is larger than a predetermined rate An electronic album system according to claim 5 with an image photography function characterized by processing to said image data according to information on said display parameter for making lightness at the time of a display high.
[Claim 11] The electronic album system according to claim 5 with an image photography function characterized by to establish an image classification processing means classify the image data concerned into said image reconstruction section based on an image classification parameter setup means generate an image classification parameter showing the conditions concerned while receiving from a user conditions which specify the feature of an image, and said photography condition data and said display parameter, said image classification parameter and said image data.
[Claim 12] Said image-processing means is an electronic album system according to claim 11 with an image photography function characterized by distinguishing a field which has said color from an image

field including said focal location or a focus location, and classifying image data according to existence of a distinguished field including information which shows a color which uses said image classification parameter for a classification of an image.

[Translation done.]